

REMARKS

In response to the Office Action mailed August 6, 2003, Applicant requests reconsideration in light of the foregoing amendments to the claims, the following remarks and request for extension of time in which to respond to the Final Office Action.

Claims 1-3 and 7 stand rejected under 35 USC §103(a) as being unpatentable over Waldron et al. (US Patent No. 6,168,067) in view of Bottiglia (US Patent No. 4,296,300).

Applicant submits that the invention as now claimed is not obvious over this combination. Waldron et al. does not disclose a cryogenic coolant. Bottiglia teaches that a cooling fluid which can indeed be a cryogenic fluid at very low temperature is applied to the back of the weld zone to cool not the weld zone but the coating material on the metal pieces to be joined. Applicants submit that their method of friction stir welding together at least two metallic workpieces including the step of applying at or adjacent the heated welding zone a cryogen in the form of at least one jet to cool the weld zone and thereby reduce tensile stresses in the weld zone and create compressive stresses in the weld zone is not obvious over this combination because neither reference teaches singularly or in combination the use of a cryogen at the weld zone to cool the heated welding zone created during a friction stir welding process. Reconsideration and reversal of this rejection are respectfully requested.

Claim 4 stands rejected under 35 USC §103(a) as being unpatentable over Waldron et al. in view of Bottiglia as applied to claims 1 and 2 above and further in view of Soviet Union Patent SU-414066.

Applicant contends that this combination of references does not teach or suggest the invention as claimed in claim 4 because although the Soviet reference teaches the application of solid carbon dioxide to the welding zone, the process that this is applied to is a form of electrowelding which is not the same as a friction stir welding process.

Accordingly, there is no teaching or suggestion to combine these three references as argued above with regards to the combination of Waldron and Bottiglia. There is no teaching to combine these two references to utilize a cryogen to cool the weld zone and to realize the reduction in tensile stresses and the creation of compressive stresses. Therefore there would be no reason to look to an electrowelding process for the teaching that a cryogen could be employed to cool the weld zone. Reconsideration and reversal of this rejection are respectfully requested.

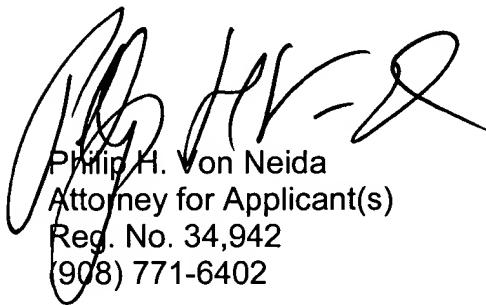
Claims 5 and 6 stand rejected under 35 USC §103(a) as being unpatentable over Waldron et al in view of Bottiglia as applied to claim 1 above and further in view of Terai et al. (US Patent No. 3,836,748).

Applicant contends that in light of the Examiner's argument that these are indeed analogous arts that this combination of references does not teach or suggest the invention of claims 5 and 6. Terai et al. utilizes the subzero treatment after the weld has been made. This is not part of the welding method step nor does it in any way teach cooling a weld zone during friction stir welding processes. The mere fact that a liquid cryogen could be employed in Terai et al. is not sufficient motivation from the combination of Bottiglia and Waldron et al. to utilize that cryogen in their process to achieve cooling of the weld zone during the friction stir welding process. Accordingly, this combination cannot be used to teach the invention and obviate the invention of claims 5 and 6. Reconsideration and reversal of this rejection are respectfully requested.

For these reasons, Applicant submits that the claimed invention defines patentable subject matter and is in condition for allowance. Prompt favorable action to that end is accordingly solicited.

The Examiner is invited to call the undersigned should any issue arise during reconsideration of the present invention.

Respectfully submitted,



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